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ABSTRACT

The Florida Information Resource Network (FIRN) is an effort by the Florida education community and the Florida Legislature to provide an electronic link among all agencies, institutions, and schools in the public education system. The communications link, perhaps one of the most advanced in the nation, has three purposes: (1) to provide equal access to computing resources for all public education entities in the state for both adminstration and instruction; (2) to reduce the data burden on teachers and administrators while providing timely, high-quality data at all levels; and (3) to enable the rapid and effective exchange of computerized information within the public education system. Once completed, FIRN will allow the State Department of Education to communicate information electronically to all local education agencies, and it will allow those agencies to communicate reports electronically to the department. By the end of the decade, Florida school districts will submit all state reports electronically through FIRN, and to satisfy this requirement, automated systems for student, staff, and financial data will be developed in each district. By July 1, 1988, detail-level student and staff reporting systems will be implemented. Future plans for the system include using it to support a statewide automated library system and research projects conducted in the state university system. Also under consideration are ways to use the network to permit students to communicate with their peers via the written "electronic" word for the purpose of expanding their language arts skills. (EW)

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Florida Information Resource Network

Francis C. Watson

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Introduction

The Florida Information Resource Network (FIRN) is an ambitious effort being undertaken by the Florida education community and the Florida Legislature to electronically link all agencies, institutions, and schools in its public education system. Perhaps the most advanced educational data communications network in the nation, it has three main purposes:

- To provide equal access to computing resources for all public education entities in the state, for administration and instruction
- To reduce the data burden on teachers and administrators while providing timely, high-quality data for managers at all levels
- To rapidly and effectively exchange computerized information within the public education system

Data communications equipment located in strategic centers throughout the state is being used to connect all 67 school districts and 33 area vocational-technical centers, 28 community colleges, and the 9 state universities into the FIRN network.

Once completed, FIRN will allow the State Department of Education to communicate information electronically to all local education agencies, and it will allow those agencies to communicate reports electronically to the Department. The exchange of data/information between users will be in either batch or on-line mode, and will include interactive access to many data bases. It currently provides students and faculty on any given campus access to unique computing capabilities available on other campuses, and permits administrators in the more remote districts and colleges to use the computer resources of the more sophisticated districts and institutions.

History

The idea for FIRN was conceived and planned by the Florida Department of Education (DOE), school districts, and universities in a cooperative effort. It grew out of a statewide computer resource-sharing legislative program begun in 1977, further expanded an existing state university system computer network, and utilized other resources that were already in place. In response to a 1981 legislative directive, the DOE staff and the School District Council on Comprehensive Management Information Systems (SDCCMIS), representing the 67 school district superintendents and school boards, developed a long-range, five-phase implementation plan for FIRN. The plan was adopted by the State Legislature in 1982.

Phase I, which included the establishment of regional computing consortia, involved no new funding. It provided limited computing capabilities for all districts and laid the groundwork for electronic reporting to the DOE via magnetic tape.

In phase II, Tymnet Inc. was awarded a contract for a pilot project to demonstrate several required capabilities for Florida's electronic data communications network. These included (1) electronically transmitting student FTE funding data from a school district computer to a university computer serving the DOE in the state capital, (2) transferring student transcripts from a school district to a community college, and (3) linking a rural north Florida high school with a large south Florida school district 500 miles away, giving the rural school access to automated student information system services.

Phase III will be completed in 1987, when all 67 school districts will have a direct link into the network. As of August 1, 1987, 65 of the 67 districts have been connected as planned. The remaining two are expected to be linked by the end of 1987. By the end of 1988, all 28 of the community colleges will also be on-line.

Implementation of phases IV and V focuses on software development to support computer-based applications for the administration of public education. The network will provide interactive communication between districts, the DOE, and the Legislature. Ad hoc information retrieval and reporting of student-based educational systems also will be possible. Educational entities, down to the school level in phase V, will use automated data bases and remote data entry to fulfill state-mandated reporting requirements. Detail-level student and staff reporting systems, culminating phase V's implementation, go into effect July 1, 1988. Decision making at all levels will be enhanced by the use of more timely and accurate information.

While almost all objectives contained in the 1982 plan for FIRN have been accomplished, its potential in both instructional and administrative areas continues to be utilized for new and innovative purposes. Other state agencies are using the FIRN plan as a model to plan for additional state data communications networks in Florida.

Administration

Initially a one-year project, FIRN was guided by two oversight bodies:

- The School District Council for Comprehensive Management Information Systems (SDCCMIS), which has actively coordinated MIS issues among districts and the DOE for several years.

- The FIRN Technical Advisory Board. Comprised of data processing and data communication specialists from districts, community colleges, and universities, the Technical Advisory Board was established to guide vendor selection and evaluate the results of the pilot. It now provides guidance to the FIRN network staff on technical matters.

FIRN became an ongoing activity when the pilot project was successfully completed, and a "board of directors" drawn from FIRN's entire user community was formed to set policy and guide future development. The FIRN Coordinating Council was appointed to meet this need. It consists of the following members:

Florida's Commissioner of Education (chair)
Two university presidents
Two community college presidents
Two school district superintendents
One state university system MIS representative
One community college MIS representative
Four school district MIS representatives

The two original oversight bodies continue to participate in FIRN's management. The SDCCMIS is represented on the FIRN Coordinating Council, and the Technical Advisory Board is convened periodically to provide guidance on network problems, enhancements, and growth plans.

Funding

Funding is provided annually by general revenue appropriations specifically designated by the State Legislature for FIRN. This funding is managed by the DOE in accordance with budgets approved by the FIRN Coordinating Council. Since FIRN's beginning, its appropriations have increased in each July-through-June fiscal year:

FY 82–83	$ 518,577
FY 83–84	$2,279,895
FY 84–85	$4,396,415
FY 85–86	$6,278,230
FY 86–87	$7,778,230
FY 87–88	$8,606,284

Once FIRN has expanded to include all Florida public education users, its funding may have to be supported partially through user charges. For predictability, such a system is likely to be based on type and number of network connections, rather than connect time or characters transmitted, as is done in commercial packet-switching networks. Any new charging system will be phased in over a two-to-four year period.

State-level funding is used to operate and maintain the network, for the development of specialized application software for use within the DOE, and for applications software, equipment, and staffing at the local level to assure effective utilization of the network's resources.

Technology

Two physically distinct data communication networks comprise FIRN—one based on IBM's System Network Architecture (SNA) and the other on Tymnet's networking system, sometimes called an X.25 network. Bridges between the two provide equal access, allowing users connected to one network to reach systems attached to the other. The Tymnet side is a state-owned private network with access into Tymnet's international public data network.

The nucleus of FIRN/SNA is the state university system network linking five regional data centers. The university system network evolved during the 1970s as the regional data centers gradually established links among themselves. This allowed efficient movement of data between the nine universities and the Board of Regents, and permitted researchers at one university to use computer software and data bases housed at another.

Students were also provided instructional services through the network.

FIRN/Tymnet connects terminal equipment and computer facilities for which an SNA connection is not possible or desirable. It provides flexible support for low-cost dial-up asynchronous terminals, minicomputers (which support the X.25 standard rather that SNA protocols) and large non-IBM mainframes. It allows asynchronous terminals to access IBM data centers as if they were IBM 3270 terminals, and provides local dial-up telephone access for interactive and batch terminals in every major urban area of the state. FIRN/Tymnet provides a single unified system in place of its "plumber's nightmare" predecessor—a maze of multiplexors, protocol converters, and port selectors.

By combining these two networking technologies, FIRN is able to meet a much greater variety of data communication needs than could any single solution. This hybrid strategy allows FIRN to support users' existing equipment and software rather than forcing them to change solely to be compatible with a particular networking environment.

Applications

FIRN provides technical support for a variety of host-based applications accessible through the network, including:

- Batch transmission of data files to and from DOE
- Interactive access to DOE student data base
- Automated submission of quarterly FTE data to DOE for funding
- Automated submission of monthly district National School Lunch claims reimbursement forms to DOE
- Electronic mail for corresponding with other FIRN users
- Access into BITNET, the international higher education network
- Electronic bulletin boards for disseminating news items, memos, and bulletins from DOE

- Access to software and services for student record processing, including attendance, scheduling, and grade reporting
- Access to a computer-aided instruction system capable of course design for teachers, trainers, or curriculum developers
- On-line access to DOE teacher certification files
- Access to a data base of microcomputer instructional software evaluations
- Access to a data base of science test questions and objectives, elementary through high school (other areas under development)
- Access to CHOICES, a data base of career information for students
- Access to various Florida Department of Commerce data bases, including census data
- Access to a statewide postsecondary course numbering system

Security

Protection of data against unauthorized disclosure, alteration, or destruction has been a fundamental principle of FIRN since its beginning. In conjunction with the host data centers, FIRN employs a variety of technologies to provide a secure environment for the information resources supported by the network.

Problems

The evolution of FIRN has provided an abundance of challenges. The continuing support of the Florida Legislature, including but not limited to funding, has assisted in keeping problems to a manageable number.

Significant problems affecting FIRN's implementation include:

- Technical problems arising from linking various vendors' hardware and software
- The divestiture in the telephone industry, which has increased the complexity of data communications
- The lack of standardized data elements in local data bases for transmission through FIRN to DOE and to other users
- "Suspicions" between the different agency types—school districts, community colleges, and universities
- Politics associated with linking autonomous agencies into a unified network, including security considerations
- Training of personnel to effectively use FIRN, both at the state and local levels
- Acceptance of "radical" new ways of reporting data to DOE—individual rather than aggregate
- The natural reluctance of people to accept new technologies
- Funding—never enough to do what everyone wants to do, when they want to do it

The Future

By the end of the decade, the ability of DOE to provide timely and accurate information to the Legislature, State Board of Education, and others will be greatly enhanced. Florida school districts will submit almost all state reports electronically through FIRN. To satisfy this requirement, automated student, staff, and finance systems will be operational in each district. July 1, 1988, will see the implementation of the detail-level student and staff reporting systems.

Requests for transcripts will be fulfilled much more promptly when high school seniors' records become available electronically to both community colleges and universities. Similarly, transcripts for community college students will be available to universities. Support for a multitude of additional student-support activities will become commonplace. Two examples of such additional services being implemented during 1987–88 include a data base containing information on scholarships, and a more efficient statewide system of processing applications for student loans.

Near-future plans call for the use of FIRN to support a statewide automated library system—LUIS—to promote resource sharing among all public postsecondary education institutions and public libraries. It is anticipated that high schools may also use this service later on. In addition, FIRN will be used to support numerous research projects conducted in the state university system. FIRN is coordinated with other efforts under way in Florida that include the establishment of a satellite network primarily for public education, and other state agencies' data and voice communications networks.

Activities are also underway for students in public schools to utilize the FIRN network to communicate with their peers through the use of the written "electronic" word, for the purpose of expanding their language arts skills. The potential for using the network for downloading instructional software from a central facility to specific schools has also been explored. However, concerns relating to copyright issues have postponed this use of FIRN.

I would like to express my appreciation to Mrs. Jill T. Draper, Research Associate, Florida Department of Education, for her assistance in preparing preliminary FIRN publications from which parts of this paper were derived.

Francis C. Watson

Francis Watson is currently systems development coordinator for the Office of Educational Technology in the Florida Department of Education. He has been involved with the planning and implementation of FIRN from its inception in 1981. Prior to joining Ed Tech, he served as the department's coordinator of Management Information Systems within the Division of Vocational Education. Mr. Watson is often called on to provide technical assistance to school districts, community colleges, and universities, most often in the area of administrative applications utilizing the FIRN network.

Before joining the department, Mr. Watson worked in administrative computing activities at a variety of educational institutions. In 1972 he was awarded the Certificate in Data Processing by the Data Processing Management Association. Mr. Watson is actively involved with various professional associations, including the Florida Association of Educational Data Systems.